

TIERS
IN BRIEF

CHILDREN'S GENERAL MEDICINE

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Children’s General Medicine Services: Tiers in Brief to Support System Planning

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HOW TO CITE THE CHILDREN’S GENERAL MEDICINE SERVICES:

We encourage you to share these documents with others and we welcome their use as a reference. Please cite each document in the module in keeping with the citation on the table of contents of each of the three documents. If referencing the full module, please cite as:

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Children's General Medicine Services: Tiers in Brief to Support System Planning

1.0 Tiers of Service

1.1 Tiers of Service Framework and Approach

Planning and coordinating children's health services is a major area of focus for Child Health BC and its collaborators (health authorities, ministries, non-profit organizations, school boards, etc). The Tiers of Service framework provides a tool to define and plan such services.

Utilizing a common language and methodology, the Tiers of Service framework:

- Recognizes that health services, while important, are one of several factors that contribute to child and youth well-being overall.
- Is informed by a review of frameworks/tools in other jurisdictions around the world.
- Facilitates system planning for clinical services, knowledge sharing/training and quality improvement/research. The responsibilities and requirements for each of these three areas are defined within the Tiers framework.

Child Health BC is leading the use of the Tiers of Service approach to system planning. This is being done through:

Creation of a series of modules: For each of the major areas of health services - such as children's emergency care, children's medicine, children's surgery, children's intensive care - a Tiers of Service module has been or is being created. Each module has 3 parts:

- Setting the Stage for Tiers Development: Summary of data and literature used to create the module.
- Tiers in Brief to Support System Planning: High-level overview of key aspects to the module.
- Tiers in Full to Support Operational Planning: Significant detail regarding the (1) clinical service; (2) knowledge sharing/training; and (3) quality improvement research responsibilities and requirements.

Self-assessment based on the modules: Once a module is finalized and accepted by the key partners in the province, a self-assessment is completed. Child Health BC works with health authority partners as necessary to get this work completed.

System planning and service planning based on self-assessment results: Using the self-assessment analysis, provincial, regional and local planning is undertaken through collaboration of CHBC and its partners.

1.2 BC's Child Health Tiers of Service Modules

Below are the Tiers of Service modules. Some have been completed, some are in active development and some are being contemplated for future development.

Clinical Services modules:

- Children's General Medicine
- Children's Subspecialty Medicine
- Children's Surgery
- Children's Emergency Department
- Children's Intensive Care
- Child Development & Rehabilitation
- Children's Home-based Services
- Children's Mental Health & Substance Use

Clinical Diagnostic & Therapeutic Service modules:

- Children's Laboratory, Pathology & Transfusion Medicine
- Children's Medical Imaging
- Children's Pharmacy Services

Collectively, the modules and their components provide the foundation for provincial and health authority (HA) planning of child health services.

2.0 General Medicine Tiers of Service

2.1 Module Development

The Children's General Medical module is made up of three components:

1. Setting the Stage for Tiers Development (provides the context)
2. Tiers in Brief to Support System Planning (high-level description of the tiers, including responsibilities and requirements) (*this document*)
3. Tiers in Full to Support Operational Planning (detailed description of the responsibilities and requirements at each tier)

This document, **Children's General Medicine: Tiers in Brief to Support System Planning**, provides a high-level description of the tiers and the services provided by *generalists* and *pediatric specialist* health care providers to healthy children and children with medical conditions. Services provided by pediatric *subspecialty* health care providers are also mentioned in this document to show the service continuum. The details, however, of subspecialty medicine services are discussed in a companion module for **Children's Subspecialty Medicine**.

The General Medicine module was developed by an interdisciplinary working group comprised of a representative(s) from each of BC's HAs (various combinations of pediatricians, a pediatric subspecialist, nurses, allied health, directors/managers and planners), the BC Pediatric Society, a Child Development Centre, Child Health BC, family physicians and a meeting facilitator. The document was informed by work done in other jurisdictions, mostly notably Queensland,¹ New South Wales,²⁻⁵ Australia⁶ and the United Kingdom.^{7,8} B.C. data was used where it was available, as

were relevant BC and Canadian standards and guidelines (e.g., Accreditation Canada standards,⁹ Provincial Privileging Pediatric Medicine document,¹⁰ Provincial Privileging Pediatric Subspecialty Medicine documents (in varying stages of development)ⁱ and the Royal College of Physicians and Surgeons Objectives of Training documents for Pediatric Medicine and Medical Subspecialtiesⁱⁱ).

In addition to the working group, representatives from all BC HAs (including the First Nations HA) and other constituent and topic-specific groups were invited to provide feedback on the draft document. The final version was submitted to the Child Health BC Steering Committee for acceptance.

2.2 Module Scope

The Children's General Medicine module focuses on care provided to children as follows:

1. Hospital-based and accessible as follows:ⁱⁱⁱ
 - a. New patients: Up to a child's 17th birthday (16 years + 364 days); and
 - b. Children receiving ongoing care: Up to a child's 19th birthday (18 years + 364 days).
2. Community-based: Delivered in a variety of community settings (e.g., Child Health Clinics, Child Development Centres, Public Health Units, Community Health Centres, Nursing Stations, schools and on-reserve).

The Children's General Medicine module does not include:

- Services provided in private family physician, pediatrician, pediatric subspecialists and therapists' offices (beyond the scope of influence of the tiers of service initiative).
- Parenting and other support provided by private and non-profit agencies (beyond the scope of influence of the tiers of service initiative). Note: Parenting and other support provided directly by BC HAs is in scope.
- Services that support complex developmental and/or behavioural conditions (e.g., Cerebral Palsy, Autism, Fetal Alcohol Spectrum Disorder) (discussed in the Children's Development & Rehabilitation Services module).
- Home-based services (discussed in Children's Home-based Services module).
- Services provided in Emergency Departments (EDs) (discussed in Children's ED Services module).
- Services provided in Intensive Care Units (discussed in Children's Intensive Care Services module).
- Services provided in Neonatal Intensive Care Units (refer to Levels of Perinatal Care document at: www.perinatalservicesB.C.ca/NR/rdonlyres/24772226-FB8C-40E9-B.C.90-535481673E6E/0/LevelsofPerinatalCareGuidelinesMay2005.pdf).

ⁱ Current versions of the provincial privileging documents are available at: http://privileging.typepad.com/privileging_project.

ⁱⁱ Current versions of the Royal College Objectives of Training are available at: www.royalcollege.ca.

ⁱⁱⁱ BC Children's Hospital. Administration manual: Admission age, BCCH and Sunny Hill Hospital for Children. 2010.

- Services provided to support children whose primary diagnosis is a psychiatric condition (discussed in Children’s Mental Health and Addictions document).

2.3 Recognition of the Tiers

The Child Health Tiers of Service framework includes six tiers of service.

Tier	Child Health Framework Tiers of Service
T1a	Prevention, Primary & Emergent Health Services
T1b	General Health Services
T2	Child-Focused Health Services
T3a	Designated Children’s Health Services
T3b	Children’s Regional Subspecialty Health Services
T4	Children's Provincial Subspecialty Health Services

The Children's Medicine module recognizes each of the six tiers:

- Children's *General* Medical Services: T1a, T1b, T2, T3a, T3b and T4.
- Children's *Subspecialty* Medicine Services: T3b and T4.

Table 1 provides an overview (Tiers at a Glance) of **Children’s Medicine Tiers of Service** (*General Medicine* and *Subspecialty Medicine*). Details of *General Medicine* services are available in this document while the details of *Subspecialty Medicine* services are provided in a companion module, *Children's Subspecialty Medicine*.

Table 1: Children’s Medicine Tiers at a Glance (General and Subspecialty Medicine)

		Prevention, Primary & Emergent Health Services	General Health Services	Child-Focused Health Services	Designated Children’s Health Services	Children’s Regional Subspecialty Health Services	Children’s Provincial Subspecialty Health Services
Document		T1a	T1b	T2	T3a	T3b	T4
Service reach		Local community.	Local community/local health area.	Multiple local health areas/health service delivery area.	Health service delivery area/health authority.	Health authority.	Province.
Service focus		<p>Supports the health & well-being of infants, children, youth & their families.</p> <p>Local services for emergent care.</p> <p>Stabilizes & refers/transfers as necessary.</p>	<p>Diagnoses & provides definitive treatment for children with low acuity/complexity conditions & minor, uncomplicated single system injuries.</p> <p>Stabilizes & refers/transfers as necessary.</p>	<p>Diagnoses & provides definitive treatment for children with relatively common, medium acuity/complexity conditions & uncomplicated single system injuries.</p> <p>Stabilizes & refers/transfers as necessary.</p>	<p>Diagnoses & provides definitive treatment for children with a broad range of medium acuity/complexity conditions (including complex psychosocial issues) & non-life-threatening single & two-system injuries.</p> <p>Stabilizes & refers/transfers as necessary.</p>	<p>Diagnoses & provides definitive treatment for children with high acuity &/or relatively common high complexity conditions (including complex psychosocial issues) & single & two-system injuries. The range of conditions is dependent upon the types of subspecialists available.</p> <p>Stabilizes & refers/transfers as necessary.</p>	<p>Diagnoses & provides definitive treatment for children with the full range of high acuity/high complexity medical conditions (including complex psychosocial issues) & multiple-system injuries, many of whom require care from with multiple specialty/subspecialty teams.</p> <p>Provincial pediatric trauma centre.</p>
Children’s Medical Services <i>(General & Subspecialty Medicine)</i>	Inpatients		<p>Limited capacity for short-term inpatient stays (in the ED or a general inpatient bed). No <u>designated</u> pediatric inpatient beds.</p> <p>If child in hospital, FP/NP on-call 24/7.</p>	<p>Designated pediatric inpatient beds.</p> <p>Pediatrician on-call 24/7.</p>	<p>Dedicated pediatric inpatient teaching unit.</p> <p>Pediatrician on-call 24/7.</p>	<p>Dedicated pediatric inpatient teaching unit.</p> <p>Pediatrician (or resident) <u>on-site</u> 24/7.</p> <p>Pediatric subspecialty teams available locally for on-site consultation in higher volume subspecialties (e.g., neurology, GI, cardiology) - not 24/7.</p>	<p>Dedicated pediatric inpatient teaching units, grouped by specialties/subspecialties.</p> <p>Pediatrician (or resident) <u>on-site</u> 24/7.</p> <p>Full range of pediatric subspecialty services available for on-site patient management & consultation 24/7.</p>

Document		Prevention, Primary & Emergent Health Services	General Health Services	Child-Focused Health Services	Designated Children's Health Services	Children's Regional Subspecialty Health Services	Children's Provincial Subspecialty Health Services
		T1a	T1b	T2	T3a	T3b	T4
Outpatient s			<p>Clinic space & infrastructure available for visiting specialists & telehealth consultations (in the ED, hospital outpatient or community-based clinic).</p>	<p>Algorithm in place to manage children discharged from hospital or ED requiring short-term follow-up by a pediatrician.</p> <p>Child-friendly treatment/procedure space & infrastructure. May be shared with adults.</p>	<p>Outpatient clinics:</p> <ul style="list-style-type: none"> • General pediatrics • Child maltreatment (non-acute) <p>Teaching focus is on general pediatrics.</p> <p>Hosts outreach clinics for visiting pediatric subspecialty teams (on-site or via telehealth).</p> <p>Child-friendly clinic(s) & outpatient treatment/procedure space & infrastructure. May be shared with adults.</p>	<p>Same as T3a plus:</p> <p>Pediatric outpatient clinic & treatment/procedure space is used exclusively by children.</p> <p>Regularly occurring pediatric subspecialty clinics available on-site for higher volume specialties (e.g., neurology, GI, cardiology). Subspecialty outreach clinics (on-site or via telehealth) may be offered, usually within the HA. Staffed by local subspecialty teams.</p> <p>Hosts outreach clinics for visiting pediatric subspecialty teams (on-site or via telehealth), usually for lower volume specialties.</p> <p>Teaching focus is on general pediatrics & higher volume pediatric subspecialties.</p>	<p>Full range of pediatric specialty & subspecialty clinics on-site, many of which involve multiple subspecialty teams.</p> <p>Coordinates & provides pediatric subspecialty outreach clinics (on-site or telehealth) throughout the province.</p> <p>Teaching & research focus is on general pediatrics & pediatric subspecialties.</p>
Community-based	<p>Supports healthy child development, injury prevention & parenting.</p> <p>Screens for developmental delays or other health issues.</p> <p>Identifies, monitors & intervenes for children with potential or uncomplicated developmental issue.</p> <p>Refers for further assessment or treatment of developmental delays or other health issues.</p> <p>Provides immunizations.</p>		<p>Assessment & follow-up of referred children.</p> <p>Youth-specific drop-in health care services.</p>	<p>Advanced assessment & follow-up of referred children.</p>	<p>Same as T3a.</p>		

3.0 Children’s General Medicine Tiers in Brief

This section describes the responsibilities, relative capabilities and resource requirements to provide general medical services at each tier.

The expectation is that the requirements at each tier will align with the responsibilities. Occasional exceptions may occur, usually due to geography and transportation, in which treatments/procedures are done on an **unplanned/emergency** basis by services that would not normally do such treatments/procedures. These exceptions are appropriate in situations in which the resources (trained personnel, equipment, etc) are available and deferring the treatment/procedure would be detrimental to the outcome for the child. Another circumstance in which exceptions may occur is in **unique, planned** situations where children with chronic conditions are supported to remain living in their home community (e.g., children with chronic ventilators).

The responsibilities and requirements at each tier are intended as a “package.” The “package” must be substantially in place for a service to be designated a specific tier. For example, a community with a pediatrician (one of the attributes of a T2 service) but without the other attributes of a T2 service (e.g., inpatient pediatric beds) would be considered a T1b rather than a T2 service.

3.1 Differentiation of the Tiers

3.1.1 Definitions

“Acuity” and “medical complexity” are the terms used to differentiate the tiers from each other. Refer to Tables 2 (medical complexity) and 3 (acuity) for definitions.

Table 2: Levels of Medical Complexity

Note: None (no complexity) = Healthy child

	Medical Complexity		
	Low	Medium	High
Relative frequency	Common; AND	Common or uncommon; AND	Common or uncommon; AND
Systems affected	Single system condition; AND	Single or multi-system; AND	Multi-system; AND
Course of illness	Predictable; AND	Predictable; AND	Unpredictable; AND
Availability of care algorithms/protocols	Yes; AND	Some conditions; AND	No; AND
Risk associated with short-term, intercurrent acute illness	Unlikely to create immediate risk; AND	Unlikely to create immediate risk; AND	May create immediate risk; AND
Exacerbations	Exacerbations, if present, do not require emergent intervention; exacerbations are	Exacerbations may require emergent intervention; exacerbations are predictable & not life-	Exacerbations are frequent & often linked to significant disability &/or threat to life & limb; AND

	Medical Complexity		
	Low	Medium	High
	predictable & not life-threatening; AND	threatening; AND	
Range of interventions required	Standard range; outcomes are predictable; AND	Standard range; outcomes are predictable; AND	Extended & innovative range of interventions may be required. Interventions may be associated with significant risk or side effects; AND
Signs & symptoms of clinical deterioration	Obvious; AND	May be subtle; AND	Risk of unpredictable life threatening deterioration is significant & signs and symptoms may be subtle; AND
Functional limitations specific to the medical condition & its management	Functional impairments, if present, are short-lived & expected to resolve; AND	Regular monitoring & proactive planning is required to manage functional impairments; AND	Significant functional impairments may be present, often requiring prolonged dependence on: <ul style="list-style-type: none"> • Device-based support (e.g., tracheostomy, suctioning, oxygen support, tube feeding &/or mechanical ventilation); AND/OR • Other medical devices requiring regular care/monitoring (e.g., apnea monitors, renal dialysis, urinary catheters/colostomy bags); AND
Impact if condition deviates from expected course	Unlikely to be life-threatening.	Unlikely to be life-threatening	May be life-threatening
Examples	Well controlled asthma or diabetes, psoriasis, obesity, autoimmune hypothyroidism, celiac disease.	Common conditions: Common and/or repaired congenital heart disease, cerebral palsy with some co-morbidities, epilepsy, spina bifida, Crohn's disease, juvenile arthritis, nephrotic syndrome. Uncommon conditions: Sickle cell disease, Cystic fibrosis, hemophilia, Hirschsprung's disease, HIV infection.	Common conditions: complex congenital heart disease, known genetic syndrome with multiple congenital anomalies (Angelman's, Prader-Willi, Noonan), muscular dystrophy, spinal muscular atrophy. Uncommon conditions: extremely rare metabolic disorders, rare or undiagnosed syndrome with active multisystem involvement, fragility and neurological impairment, ex-preterm infant with numerous sequelae (developmental delay, hydrocephalus, seizures, aspiration, pulmonary hypertension, gastrostomy tube, spasticity, neurogenic bladder, etc.)

Table 3: Levels of Acuity

	Acuity		
	Low	Medium	High
Presenting problem	Non-urgent	May be urgent or expected to progress to be urgent in the foreseeable future. May be associated with significant discomfort or inability to function.	Potential or real threat to life, limb or function. May be associated with significant discomfort or inability to function.
Potential for immediate deterioration	No history suggestive of potential for immediate deterioration	Stable & not deteriorating. Need for ICU would be an unexpected event.	Potential for immediate deterioration. Need for ICU may be expected.
Investigations & interventions	Non-urgent investigations & interventions required.	Some investigations & interventions required in the immediate-term	Immediate & possibly extensive investigations & interventions required. Typically requires an inpatient stay up to & including ICU.
Examples	Acute otitis media, vomiting, hematuria, constipation in an otherwise healthy child, concussion, mild-moderate failure to thrive.	Persistent vomiting, exacerbation of asthma, mild to moderate dehydration, afebrile or febrile seizures, Kawasaki disease, pneumonia, croup.	Bacterial meningitis, septic shock, intractable seizures, acute renal failure, severe anemia, volvulus, enterocolitis.

3.1.2 Relationships: Medical Complexity, Relative Frequency, Acuity & Tiers

Table 4 provides an overview of the relationship between medical complexity, relative frequency, acuity and the appropriate tier of service provision. Table 5 provides examples of children who would be expected to receive services at each tier.

Table 4: Children Appropriate to Receive Services at Each Tier (based on Medical Complexity, Relative Frequency & Acuity)

Underlying Condition		T1a			T1b			T2			T3a			T3b			T4		
Medical Complexity	Relative Frequency	Acuity of Presenting Complaint																	
		Low	Med	High	Low	Med	High	Low	Med	High	Low	Med	High	Low	Med	High	Low	Med	High
Healthy		Eg 1							Eg 4							Eg 11			
Low		Eg 2							Eg 5							Eg 12			
Med	Common							Eg 3	Eg 6							Eg 13			
	Uncommon										Eg 7	Eg 8				Eg 14			
High	Common													*	*		Eg 9	Eg 10	
	Uncommon																Eg 15	Eg 17	**
																	Eg 16	Eg 18	Eg 19
																			Eg 20

Legend for Table 4:

- Eg Refer to Table 5 for examples of children appropriate to receive services.
- * Applicable only if relevant medical subspecialty team is available
- ** May be provided by general medicine team if on-site access exists to medical and surgical subspecialists.
- T1a Tier 1a: Prevention, Primary & Emergent Health Services
- T1b Tier 1b: General Medical Services
- T2 Tier 2: Child-Focused Medical Services
- T3a Tier 3a: Designated Children's Medical Services
- T3b Tier 3b: Children's Regional Subspecialty Medical Services
- T4 Tier 4: Children's Provincial Subspecialty Medical Services

NOTE:

Psychosocial complexity, in addition to medical complexity, may impact the appropriate tier of service provision. Children with significant psychosocial issues generally require the services of T3a or above.

Table 5: Examples of Children Appropriate to Receive Services at Each Tier (application of the principles in Tables 2, 3 & 4)

#	Med Complexity	Relative Frequency	Acuity	Example	Tier of Service Required
1	Healthy		Low	Otherwise healthy child presenting with otitis media	T1a, T1b
2	Low		Low	Child with well controlled asthma presenting with hematuria	T1a, T1b
3	Med	Common	Low	Child with Crohn's disease presenting with acute otitis media	T2
4	Healthy		Med	Healthy child presenting with persistent vomiting and mild to moderate dehydration	T2
5	Low		Med	Child with celiac disease presenting with pneumonia	T2
6	Med	Common	Med	Child with cerebral palsy presenting with afebrile or febrile seizures	T2
7	Med	Uncommon	Low	Child with hemophilia presenting with hematuria	T3a
8	Med	Uncommon	Med	Child with HIV infection presenting with pneumonia	T3a
9	High	Common	Low	Child with complex congenital heart disease presenting with failure to thrive	T3b (if pediatric cardiologist available) - otherwise T4
10	High	Common	Med	Child with Duchene's muscular dystrophy presenting with pneumonia	T3b (if pediatric neurologist available) - otherwise T4
11	Healthy		High	Otherwise healthy child presenting with bacterial meningitis	T3b - (if PICU available) - otherwise T4
12	Low		High	Child who is obese presenting with septic shock	T3b - (if PICU available) - otherwise T4
13	Med	Common	High	Child with cerebral palsy presenting with intractable seizures	T3b - (if PICU available) - otherwise T4
14	Med	Uncommon	High	Child with Hirschprung's disease presenting with enterocolitis	T3b - (if PICU available) - otherwise T4
15	High	Common	Low	Child with Angelman's Syndrome presenting with concussion.	T4
16	High	Uncommon	Low	Child with an unknown genetic diagnosis involving severe neurological impairment and multisystem chronic disease, presenting with acute otitis media.	T4
17	High	Common	Med	Child with Prader-Willi Syndrome presenting with exacerbation of asthma	T4
18	High	Uncommon	Med	Ex pre-term infant with numerous sequelae (e.g., developmental delay, hydrocephalus) presenting with persistent vomiting	T4
19	High	Common	High	Child with complex congenital heart disease presenting with meningitis	T4
20	High	Uncommon	High	Child with a fatty acid oxidation disorder presenting with metabolic decompensation in the setting of a febrile illness.	T4

3.2 Responsibilities and Requirements at each Tier

This section describes the responsibilities and requirements at each tier to provide a **safe**, **sustainable** and **appropriate** level of service. Clinical services are divided into: (1) inpatient; (2) hospital-based outpatient; and (3) community-based.

Tier 1a: Prevention, Primary and Emergent Health Services

T1a: Service descriptions & responsibilities

Service reach:	Serves children that live in the local community.
Service focus:	Supports the health & well-being of infants, children, youth & their families.
Service responsibilities	
Clinical services:	
<i>Inpatient</i>	
<i>Hospital-based outpatient</i>	
<i>Community-based</i>	<ul style="list-style-type: none"> • Services focus on: <ul style="list-style-type: none"> • Promoting healthy infant, child & youth development, injury prevention & parenting. • Screening, supporting & referring children at risk for or experiencing: (a) developmental, communication/language or cognitive delays; or (b) vision, hearing, nutrition or dental issues. • Providing immunizations. • Services are delivered in a variety of community settings.
Knowledge sharing & transfer/training:	<ul style="list-style-type: none"> • Facilitates access to learning activities that support the maintenance of competencies in child health. e.g., on-line access to child health guidelines/reference materials/continuing education courses (e.g., PALS) & participation in HA & provincial learning activities relevant to child health (e.g., pediatric rounds & conferences).
Quality improvement & research:	<ul style="list-style-type: none"> • Regularly reviews the quality of care provided, including case reviews. If child involved, physicians & staff with child health expertise participate in the review. Implements recommendations. • Concepts of child & family-centred care are incorporated into child health programming (see glossary). • Obtains child/family feedback on the services provided. Incorporates feedback, as appropriate. • Participates in regional & provincial child health quality improvement initiatives.

T1a: Service requirements

Inpatient

*Hospital-based
outpatient*

Community-based

- Staff competent in the assessment, care & delivery of health promotion & screening services for infants, children, youth & families.
- Staff typically includes: Community-based FPs, NPs, RNs with relevant certified practice designation, public health nurses, RNs, community nutritionists, dental hygienists, non-health professional staff with appropriate education & training (e.g., health unit aides, maternal child health home visitors/workers), Elders & HealthLink BC staff.
- Post-screening referral pathways to early intervention, child protection & pediatric specialty services.
- Well-defined linkages between hospital & community-based services, including services provided to children living on-reserve.
- Guidelines to support transition from children's to adult services.

Tier 1b: General Medical Services

T1b: Service descriptions & responsibilities

Service reach: Serves children that live in the local community/local health area (LHA).^{iv}

Service focus: Diagnoses & provides definitive treatment for children with low acuity/complexity medical conditions. Presenting problem is usually non-urgent. Inpatient stay rarely required.

Service responsibilities

Clinical services:

Inpatient

- Very limited inpatient capacity for children.
- Inpatient stays are usually less than 48 hours, after which children are discharged or transferred to a centre with designated pediatric inpatient beds.
- Provides routine inpatient nursing care including assessment, care planning, treatments, monitoring, teaching & discharge planning (see Tiers in Full for details).
- Takes action to ensure immediate safety needs are met (e.g., during mental health crises; cases of suspected child maltreatment). Capacity to certify a child as per the Mental Health Act, if required.
- Assesses & stabilizes critically ill children while arranging & awaiting transfer.

^{iv} See www.bcstats.gov.bc.ca/statisticsbysubject/geography/referencemaps/Health.aspx for a listing of LHAs in BC.

<i>Hospital-based outpatient</i>	
<i>Community-based</i>	
Knowledge sharing & transfer/training:	<ul style="list-style-type: none"> Facilitates access to learning activities that support the maintenance of competencies in child health. e.g., on-line access to child health guidelines/reference materials/continuing education courses (e.g., PALS) & participation in HA & provincial learning activities relevant to child health (e.g., pediatric rounds & conferences).
Quality improvement & research:	<ul style="list-style-type: none"> Regularly reviews the quality of care provided, including case reviews. If child involved, physicians & staff with child health expertise participate in the review. Implements recommendations. Concepts of child & family-centred care are incorporated into child health programming (see glossary). Obtains child/family feedback on services provided. Incorporates feedback, as appropriate. Participates in regional & provincial child health quality improvement initiatives.

T1b: Service requirements

<i>Inpatient</i>	<ul style="list-style-type: none"> Capacity for short-term inpatient stays (in the ED or a general inpatient bed). Bed(s) meets criteria for "safe pediatric bed" (see glossary). No <u>designated</u> pediatric inpatient resources/beds. If child in-hospital, FP/NP on-call 24/7 & available on-site as needed. RNs assigned to children have "pediatric skills" (see glossary). Practice predominantly involves adults. Psychosocial & allied health providers available on request for individual cases. Practice is predominantly with adults. BC Pediatric Early Warning System (PEWS) implemented in areas as defined by Child Health BC. Referral pathways in place to access mental health professionals. Smart IV pumps used for all children on IVs. Processes in place for safe medication dispensing, storage & administration, including weight-based dosage calculations. General laboratory, x-ray & ECG services available. Refer to relevant modules for specifics (under development).
<i>Hospital-based outpatient</i>	<ul style="list-style-type: none"> Clinic space & infrastructure available for visiting specialists & telehealth consultations (in the ED, hospital outpatient or community-based clinic).
<i>Community-based</i>	

Tier 2: Child-Focused Medical Services

T2: Service descriptions & responsibilities

Service reach: Serves children that live in multiple local health areas &/or the health service delivery area (HSDA).

Service focus: Diagnoses & provides definitive treatment for children with relatively common, medium acuity/complexity medical conditions. Presenting problem may be urgent or expected to progress to be urgent in the foreseeable future. May be associated with significant discomfort or inability to function. Some will require a day procedure or inpatient stay.

Assessment & community-based follow-up of children referred for vulnerabilities,^v delays & other health issues identified through screening.

Service responsibilities

Clinical services:

Inpatient

- Provides care in designated pediatric inpatient beds to children with relatively common, medium acuity/complexity medical conditions.
- Offers inpatient nursing procedures & treatments which include:
 - Standard assessment & monitoring.
 - Care planning, teaching & discharge planning.
 - Initiation & maintenance of continuous intravenous infusions with pre-mixed electrolytes.
 - Medication administration including: (a) analgesics via topical, enteral, intranasal, rectal, PO, SQ & IM injection & intermittent IV routes; & (b) a range of other intermittent IV medications via syringe & mini-bag.
 - Maintenance of PICC lines.
 - Infusion of blood & blood products.
 - Administration of supplemental O₂ up to 40% in children who are stable & showings signs of improvement. Resolution expected within 2 - 3 days.
 - Inserts, replaces & maintains NG tubes for short-term hydration. Replaces & maintains established G-tubes.
- Provides consultation & follow-up for children referred for suspected maltreatment. Refers complicated cases to T3/T4 child protection team.
- Assesses & stabilizes critically ill children while arranging & awaiting transfer.
- Pediatric case volumes (minimum): 200 medical visits (day care & inpatient) & 500 med/surg inpatient days per year (excluding NICU).

^v Children & families who may be at risk for poor outcomes associated with lifestyle/ behavioural, psychosocial or environmental risk factors.

Hospital-based outpatient

Clinic services:

- Algorithm in place to manage children discharged from hospital or ED requiring short-term follow-up by a pediatrician.
- High volume sites may offer (not required) pediatric-focused diabetes & asthma services.

Outpatient procedures & treatments:

- Performs outpatient procedures & treatments that have a low risk of allergic reactions/complications which include:
 - Monitoring (e.g., vital signs, weights, O2 saturations, spirometry)
 - Diagnostic tests/procedures (e.g., lumbar puncture, bladder catheterization)
 - IV therapy (e.g., IV fluids, IV starts, blood products, antibiotics, CVC/ICC/CADD care)
 - Maintenance of peripherally inserted central catheter (PICC) lines.
 - Teaching (e.g., home NG, rectal valium, home IV)
 - Wound management/dressing changes
 - Selected chemotherapy medications as per provincial guideline & direction provided by T4.
 - Other (e.g., insertion NG tube, IM/SQ injections)
- Provides oral sedation to children undergoing diagnostic or therapeutic treatments/procedures.

Community-based

- Provides assessment & follow-up services for children referred for developmental, communication/language or cognitive delays or vision, hearing, nutrition or dental issues. Provides enhanced services to parents/families with identified vulnerabilities.
- Provides accessible, confidential health care services to youth on a drop-in basis.

Knowledge sharing & transfer/training:

- Facilitates access to learning activities that support the maintenance of competencies in child health, including the practice of critical clinical skills. e.g., simulation, clinical experience with T3/T4 service.

Quality improvement & research:

- Regularly reviews the quality of care provided, including case reviews. If child involved, physicians & staff with child health expertise participate in the review. Implements recommendations.
- Provides child health expertise for T1 case reviews, if requested.
- Concepts of child & family-centred care are incorporated into child health programming (see glossary).
- Obtains child/family feedback on the services provided. Incorporates feedback, as appropriate.
- Participates in regional & provincial child health quality improvement initiatives.

T2: Service requirements

Inpatient

- Pediatrician on-call 24/7 & available for on-site consultation as needed. Inpatients are typically admitted under a pediatrician.
- Children are assigned to RNs with "pediatric skills" 24/7 (see glossary). Practice may be predominantly with adults but includes some children. Formalized pediatric orientation & ongoing education offered.
- "Safe pediatric beds" available on an inpatient unit (see glossary). Physical separation of children from adult patients recommended.
- Interdisciplinary team (psychosocial & allied health providers) available days, M-F on request for individual cases. Members have general pediatric knowledge & skills (most have predominantly adult practices). May be hospital-based or based in the community with in-hospital services provided via a service agreement.
- BC Pediatric Early Warning System (PEWS) implemented in areas as defined by Child Health BC.
- Smart IV pumps used for all children on IVs.
- Referral pathways in place to access mental health professionals. General psychiatrist on-call 24/7 & available for on-site consultation as needed.
- General laboratory, diagnostic & ECG services available. Refer to relevant modules for specifics (under development).

Hospital-based outpatient

Clinic services:

- If services are offered for children with diabetes &/or asthma (not required), services may be provided in the Pediatric Outpatient Clinic or as a separate clinic, often in conjunction with adult services. Staff have "pediatric skills" (see glossary). Services are linked to T3a services through HA pediatric administrative & quality structures.

Outpatient procedures & treatments:

- Pediatrician available on-site for procedures & treatments which require ongoing monitoring. Available on-call at other times.
- RNs assigned to children undergoing procedures & treatments have "pediatric skills" (see glossary). Practice may be predominantly with adults but includes some children.
- Child-friendly space & infrastructure to perform procedures & treatments. May be shared (in ED, procedure room in inpatient or outpatient area, medical day unit, etc). Capacity to provide oral sedation.
- Capacity within the operating room to provide sedation &/or anesthesia to healthy children ages 2 & over undergoing treatments & procedures (as per Surgical Tiers document).

Community-based

- Staff competent to manage children with vulnerabilities & other issues identified through screening.
- Staff & physicians with specific knowledge about youth health.
- Space to provide youth health drop-in services.

Tier 3a: Designated Children’s Medical Services

T3a: Service descriptions & responsibilities

Service reach: Serves children that live in the health service delivery area/health authority.

Service focus: Diagnoses & provides definitive treatment for children with a broad range of medium acuity/complexity medical conditions (including complex psychosocial issues). Presenting problem may be urgent & associated with significant discomfort or inability to function. May require an inpatient stay.

Advanced assessment & community-based follow-up of children referred for vulnerabilities, delays & other health issues.

Service responsibilities

Clinical services:

Inpatient

- Provides interdisciplinary care to children with a broad range of medium acuity/complexity medical conditions on a dedicated pediatric teaching unit. Some children/families may have complex psychosocial issues.
- Offers a broad range of nursing procedures & treatments, many of which are commonly not available at T2, including:
 - Up to q1h monitoring (TPR, BP, O₂ saturations, input & output, blood sugars).
 - Initiation of peripherally inserted central catheter (PICC) lines.
 - Insertion & maintenance of central venous catheters (CVCs).
 - Accessing & maintenance of venous access devices.
 - Initiation & maintenance of high risk continuous peripheral IV infusions (e.g., insulin).
 - Administration of analgesics via: (a) continuous IV to children ages 2 & over; and (b) patient controlled IV route.
 - Insertion, replacement and maintenance of NG tubes required for nutritional management.
 - Replaces established surgically-placed J-tubes (in OR). Establishes & replaces NJ tubes (in radiology).
 - Initiates, administers & monitors TPN.
 - Teaches children/families about home enteral nutrition.
 - Provides supplemental O₂ up to 40% in children who are stable & not deteriorating. Resolution is expected within 1 - 2 weeks.
- Collaborates with providers in the child's home community to develop and implement discharge plans. May involve referrals to pediatric specialists/specialty teams (e.g., nursing support services, at-home program, specialty clinics).
- Pediatric case volumes (minimum): 500 medical visits (day care & inpatient) and 1,300 med/surg inpatient days per year (excluding NICU).

Hospital-based outpatient

Clinic services:

- Provides interdisciplinary care & follow-up to children with a broad range of medium complexity medical conditions which include:
 - Children discharged from hospital or ED requiring short-term follow-up.
 - Children with complex chronic diseases who require an urgent assessment for a specific issue (e.g., feeding tube malfunction, medication titration).
 - Children with common pediatric conditions (e.g., asthma, croup, diabetes, feeding issues, constipation, food allergies, developmental delays/issues & behavioural challenges). Refer to the subspecialty medicine module for the care of children with highly complex presentations of these conditions.
 - Children with vulnerabilities related to the social determinants (e.g., low income, new immigrants, refugees).
 - Children requiring lifestyle assistance (e.g., healthy weights).
 - Children undergoing surgery that require pre- or post-op evaluation/testing.
 - Children in whom maltreatment is suspected (non-acute response).
- In collaboration with T3b/T4 subspecialty teams, provides ongoing management/monitoring for children with high complexity medical conditions that live within the HA.
- Clinic(s) designated as a teaching clinic(s) & has a pediatric focus.
- Hosts clinics for T3b/T4 visiting pediatric subspecialty teams (on-site or via telehealth).

Outpatient procedures & treatments

- Performs outpatient procedures & treatments that have a medium risk of allergic reactions/complications. Includes T2 procedures & treatments plus infusions of:
 - Steroids & antibodies (e.g., infliximab) & bisphosphonates
 - Cytotoxic &/or chemotherapy medications (as per provincial guideline & direction provided by T4 cancer & rheumatology services).

Community-based

- Provides advanced assessment & follow-up services for children referred for delays & other health issues. e.g., auditory brainstem response (ABR) testing +/- sedation to assess the cause & extent of hearing loss.
- Refer to Child Development & Rehabilitation module for other community-based services.

Knowledge sharing & transfer/training:

- Designated by UBC as a training site for undergraduate medical students, family medicine residents & pediatric residents.
- Provides child health experiences/placements for a broad range of undergraduate, graduate & post-graduate health care students.
- In collaboration with T3b, organizes regional activities that support the maintenance of physician & staff competencies in child health. e.g., pediatric rounds and conferences.
- Provides child health clinical experiences for T1/T2/T3 physicians & staff (on-site &/or via simulation).

Quality improvement & research:

- Regularly reviews the quality of care provided to children, including case reviews. Implements recommendations.
- Provides child health expertise for T1 case reviews, if requested.
- Concepts of child & family-centred care are incorporated into child health programming (see glossary).
- Obtains child/family feedback on the services provided. Incorporates feedback, as appropriate.
- In collaboration with T3b/T4, tracks regional/provincial child health quality indicators. Leads/participates in regional/provincial quality improvement initiatives.

T3a: Service requirements

Inpatient

- Pediatrician on-call 24/7 & available for on-site consultation as needed.
- "Safe pediatric unit" (see glossary) available. RNs practice exclusively or primarily with children. Formalized pediatric orientation and ongoing education offered.
- Other members of the interdisciplinary team (psychosocial & allied health providers) available days, M-F (some on extended hours). Team members have general pediatric knowledge and skills (most have practices which include adults and children).
- RT/MD on-site 24/7 to perform endotracheal intubation if required.
- Pain management team & wound/ostomy RN available days, M-F (for adults & children).
- BC Pediatric Early Warning System (PEWS) implemented in areas as defined by Child Health BC.
- Mental health services, including general psychiatrist, on-call 24/7 & available for on-site consultation as needed.
- Smart IV pumps used for all children on IVs.
- General laboratory, diagnostic imaging (x-ray, ultrasound, CT, nuclear medicine and MRI) & ECG services available. Refer to relevant modules for specifics (under development).

Hospital-based outpatient

Clinic services:

- Child-friendly clinic space(s) & infrastructure. May be shared with adults.
- Space accommodates T3b/T4 outreach services (on-site or telehealth) for selected pediatric *subspecialty* services.

Staffing	Pediatric Outpatient Clinic	Child Maltx [SCAN] Clinic ^{vi}
GP/NP/Ped'n	Ped'n +/- GP/NP	Ped'n +/- GP/NP
RN	✓	✓
Cert diabetes educator	✓ Assigned to pediatrics*	
Cert asthma educator	✓ Assigned to pediatrics*	

^{vi} May be hospital or community-based.

Staffing	Pediatric Outpatient Clinic	Child Maltx [SCAN] Clinic ^{vii}
SW	✓ for children with diabetes; On request/referral for other children.	✓ or psychologist
Dietitian	✓ for children with diabetes; On request/referral for other children.	
Child life	On request/referral	
OT	On request/referral	
PT	On request/referral	
SLP		
RT	On request/referral	
Psychologist		✓ or SW
Pharmacist	On request/referral (by phone)	On request/referral (by phone)

* = Services to children with diabetes and asthma may be provided in the Pediatric Outpatient Clinic or in separate clinics, often in conjunction with adult services.

Legend:

✓ = Consistent person(s) assigned & available on-site to participate in scheduled clinics. Consistent exposure to children with specified condition(s) allows for development of "enhanced skills" (see glossary) in specialty/subspecialty area.

On request/referral = Person(s) with general pediatric knowledge & skills is available on a limited, consultation basis to come to the clinic to assess & treat specific children. May not be a consistent person.

Notes:

1. MD requirement applies only to clinics with pre-scheduled MD visits. Protocols exist in all clinics to access urgent medical consultation outside clinic hours.
2. Algorithm in place to respond to urgent requests, provide telephone follow-up, etc outside clinic hours.

Outpatient procedures & treatments:

- Pediatrician available on-site for procedures & treatments which require ongoing monitoring. Available on-call at other times.
- RNs assigned to children have "pediatric skills" (see glossary). Practice is exclusively or primarily with children.
- Child-friendly space & infrastructure to perform procedures & treatments (in procedure room in inpatient or outpatient area, medical day unit, etc). May be shared. Capacity to provide oral sedation.
- Capacity within the operating room to provide sedation &/or anesthesia to healthy children ages 6 months & over undergoing treatments/procedures (as per Surgical Tiers document).

Community-based

- Audiologists & audiology technicians with training in advanced diagnostic testing (e.g., ABR). Audiology clinic with soundproof booth & specialized equipment & supplies.
- Staff & physicians with specific knowledge about youth health.
- Space to provide youth health care drop-in services.

^{vii} May be hospital or community-based.

Tier 3b: Children's Regional Medical Subspecialty Services

T3b: Service descriptions & responsibilities

Service reach: Serves children that live throughout the health authority (HA) (regional referral centre).

Service focus: Diagnoses & provides definitive treatment for children with high acuity &/or relatively common high complexity medical conditions (including complex psychosocial issues). The range of conditions is dependent upon the types of subspecialists available.

Advanced assessment & community-based follow-up of children referred for vulnerabilities, delays & other health issues.

Service responsibilities

Clinical services:

Inpatient

- Provides interdisciplinary care to children with a broad range of medium and a limited range of high acuity/complexity medical conditions (range depends upon the subspecialists available) on a dedicated pediatric teaching unit.
- Inpatient nursing procedures & treatments & coordination of complex discharges as per T3a plus:
 - Administers analgesics via continuous IV to children ages 6 mos & over.
 - Makes decision & establishes G & J-tubes & GJ tubes.
 - Replaces established GJ tubes (in radiology).
 - Provides oral motor & dietary assessment/consultation for children with feeding & swallowing difficulties.
 - Inserts venous access devices (in the OR).
 - Provides supplemental O₂ up to 40% in children who are stable & not deteriorating. If O₂ requirements exceed those described for T3a, consults with PICU physician.
 - Procedures & treatments relevant to T3b subspecialty services that are available on-site.
- Pediatric case volumes (minimum): 1,000 medical visits (day care & inpatient) and 5,000 med/surg inpatient days per year (excluding NICU).

Hospital-based outpatient

Clinic services:

- Provides interdisciplinary care & follow-up to children with a broad range of medium complexity medical conditions (as per T3a).
- Refers children to *pediatric subspecialty medicine* clinics which are available for higher volume specialties (e.g., cardiology, neuro, GI). Staffed by local subspecialists &/or visiting subspecialists.
- Designated as teaching clinic(s) & focuses on: (a) general pediatrics; and (b) pediatric subspecialties that are available on-site.

	<p><i>Outpatient procedures & treatments:</i></p> <ul style="list-style-type: none"> • Same as per T3a plus procedures & treatments relevant to T3b subspecialty services that are available on-site.
<i>Community-based</i>	<ul style="list-style-type: none"> • Provides advanced assessment & follow-up services for children referred for delays & other health issues. e.g., auditory brainstem response (ABR) testing +/- sedation to assess the cause & extent of hearing loss. • Refer to Child Development & Rehabilitation module for other community-based services.
Knowledge sharing & transfer/training:	<ul style="list-style-type: none"> • Same as T3a except range of pediatric experiences for health care students is broader & includes T3 NICU, high acuity/close observation unit or T3b PICU & some subspecialty care.
Quality improvement & research:	<p>Same as T3a plus:</p> <ul style="list-style-type: none"> • Participates in child health related research.

T3b: Service requirements

<i>Inpatient</i>	<ul style="list-style-type: none"> • Pediatrician (or resident) <u>on-site</u> 24/7. Inpatients are typically admitted under a pediatrician. • Pediatric subspecialty teams available for on-site consultation in higher volume services (e.g., cardiology, neurology, GI) - not 24/7. • "Safe pediatric unit" (see glossary) available. RNs practice exclusively or primarily with children. Formalized pediatric orientation and ongoing education offered. • Interdisciplinary team (psychosocial & allied health providers) available days, M-F (some on extended hours). Members work exclusively or primarily with children. • Pain management team & wound/ostomy RN available days, M-F (for adults & children). • Mental health services on-call 24/7 & available for on-site consultation as needed. Child & youth psychiatrist available days, M-F & general psychiatrist on-call after-hours & available for on-site consultation as needed. Youth mental health beds (ages 12 & over) available in the HA. • BC Pediatric Early Warning System (PEWS) implemented in areas as defined by Child Health BC. • On-site T3 NICU. • On-site high acuity/close observation unit (1:1 or 1:2 RN/child ratio) or T3b PICU. • Laboratory, ECG and diagnostic imaging (x-ray, ultrasound, CT, nuclear medicine and MRI) services available. Refer to relevant modules for specifics (under development).
<i>Hospital-based outpatient</i>	<p><i>Clinic services:</i></p> <ul style="list-style-type: none"> • Clinic staffing is as per T3a outpatient clinics plus psychologist available on request/referral. For subspecialty clinics, refer to subspecialty module. • Pediatric feeding & swallowing team available locally to provide oral

- motor & dietary assessment/consultation days, M-F.
- Capacity to perform videofluoroscopy feeding studies.
 - Pediatric-specific clinic space & infrastructure (exclusively for the use of children).
 - Space accommodates T3b/T4 outreach services (on-site or telehealth) for selected pediatric *subspecialty* services.

Outpatient procedures & treatments

- Pediatrician or designate (e.g., resident) available on-site.
- RN practice is exclusively or primarily with children.
- Pediatric-specific outpatient procedure/treatment staff, space and infrastructure which is used exclusively by children.
- Capacity within the operating room to perform procedures & treatments requiring sedation and/or anesthesia in children of any age with modest medical complexities as per the Children's Surgical Tiers module.

Tier 4: Children's Provincial Subspecialty Medical Services

T4: Service descriptions & responsibilities

Service reach: Serves children that live throughout the province.

Service focus: Diagnoses & provides definitive treatment for children with high acuity &/or high complexity medical conditions (including complex psychosocial issues), in consultation with pediatric subspecialty teams (often multiple teams).

Service responsibilities

Clinical services:

Inpatient

- Provides interdisciplinary care to children with a broad range of medium & high acuity/complexity medical conditions on dedicated pediatric teaching units, grouped by specialties/subspecialties.
- Inpatient nursing procedures & treatments available as per T3b plus:
 - Manages pain that requires an extended & innovative range of options, including regional analgesia/anesthesia (e.g., epidurals).
 - Provides care to children with a stable airway & stable ventilator requirements.
 - Provides care to children that require CPAP, BIPAP, heated humidified high-flow nasal cannula therapy under specific circumstances (refer to Tiers in Full for specific circumstances).
 - Procedures & treatments relevant to T4 subspecialty services.
- Consults with pediatric medicine subspecialty providers (e.g., cardiology, neurology, GI). Services available 24/7.
- Collaborates with providers in the child's home community to develop and implement complex discharge plans that often involve multiple pediatric specialists/programs, resources and equipment needs (e.g., NG or CVC care at home, home ventilation, home TPN, etc).

<i>Hospital-based outpatient</i>	<ul style="list-style-type: none"> • Pediatric case volumes (minimum): 4,000 medical visits (day care & inpatient) and 20,000 med/surg inpatient days per year (excluding NICU). <p><i>Clinic services:</i></p> <ul style="list-style-type: none"> • Provides interdisciplinary care & follow-up to children with a broad range of medium complexity medical conditions (as per T3b) plus: <ul style="list-style-type: none"> • Care for children experiencing: <ul style="list-style-type: none"> • Unexplained symptoms that are anticipated to require subspecialty assessment/follow-up [General Pediatric Clinic]. • Multiple medical +/- psychosocial complexities [Complex Care Clinic]. • Complex feeding and nutrition (Complex Feeding & Nutrition Clinic]. • Complex pain and somatization disorders [General Pediatric & Complex Pain Clinics] • Suspected or actual maltreatment [Child & Family Clinic]. • Care coordination & collaboration with providers in the child's home community to develop and implement complex plans that often involve multiple pediatric specialists/programs, resources and equipment needs (e.g., NG or CVC care at home, home ventilation, home TPN, etc). • Refers to on-site <i>pediatric subspecialty clinics</i>, many of which involve multiple subspecialty teams. • Teaching & research are integral components of the mandate of each clinic. Focus on general pediatrics and pediatric subspecialties. <p><i>Outpatient procedures & treatments:</i></p> <ul style="list-style-type: none"> • Same procedures & treatments as T3b plus procedures & treatments relevant to T4 subspecialty services.
<i>Community-based</i>	<ul style="list-style-type: none"> • Pediatricians & pediatric subspecialists provide telephone consultation to physicians <i>throughout</i> the province 24/7. RNs, allied health & other team members available for consultation on days, M-F. • Provides child health experiences/placements for a broad range of undergraduate, graduate & post-graduate health care students. • In conjunction with UBC, develops model for training pediatric medicine & pediatric subspecialty medicine residents in BC. • Designated by UBC as a training site for undergraduate medical students, family medicine residents, pediatric residents & pediatric subspecialty residents. Range of pediatric medicine experiences is broad, including rotations in general pediatrics, pediatric ED, neonatal care, T4 NICU, T4 PICU & sub-specialty areas. • Organizes provincial activities that support the maintenance of physician & staff competencies in child health. e.g., pediatric rounds and conferences. • Provides child health clinical experiences for T1/T2/T3 physicians & staff (on-site &/or via simulation).
Quality improvement & research:	<ul style="list-style-type: none"> • Regularly reviews the quality of care provided to children, including case reviews. Implements recommendations.

- Consults with child health experts within or outside BC for T4 case reviews, as appropriate.
- Provides subspecialty child health expertise for T1-T3 case reviews, if requested.
- Concepts of child & family-centred care are incorporated into programming (see glossary).
- Obtains child/family feedback on the services provided. Incorporates feedback, as appropriate.
- In collaboration with CHBC & HAs, establishes, collects & tracks provincial child health quality indicators & leads provincial quality improvement initiatives.
- In collaboration with CHBC & HAs, develops & disseminates guidelines on relevant child health topics. Supports the provision of guideline-based care.
- Conducts & supports others to conduct child health related research.

T4: Service requirements

Inpatient

- Pediatrician (or resident) on-site 24/7.
- Full range of pediatric subspecialists available on-call 24/7 & available for on-site consultation as needed.
- "Safe pediatric units" (see glossary) available and grouped according to medical/surgical specialties/subspecialties. All units are *clinical teaching* units.
- RNs practice is exclusively or primarily with children. Most RNs have "enhanced pediatric skills" (see glossary) in a specific subspecialty area(s). Formalized pediatric orientation & ongoing education offered.
- Interdisciplinary team (psychosocial & allied health providers) available days, M-F (some on extended hours). Members work exclusively or primarily with children. Most have "enhanced pediatric skills" (see glossary) in a specific subspecialty area(s).
- Pediatric pain management team & pediatric wound/ostomy RN available on days, M-F.
- Child & youth psychiatrist available on-call 24/7 & available on-site for consultation as needed. Child & youth mental health units available on-site.
- BC Pediatric Early Warning System (PEWS) implemented in areas as defined by Child Health BC.
- On-site T4 NICU & T4 PICU.
- Pediatric-specific laboratory, diagnostic imaging (x-ray, ultrasound, CT, nuclear medicine and MRI) & ECG services available. Refer to relevant modules for specifics (under development).

Hospital-based outpatient

Clinic services:

- Pediatric-specific clinic space & infrastructure for specialty & subspecialty clinics.
- Clinic staffing:

- General Pediatric Clinic(s): as per T3b.
- Complex Care, Complex Feeding & Nutrition, Complex Pain & Child & Family Clinics: See table below.
- Subspecialty clinics: Refer to subspecialty module.
- On-site availability of (a) pediatric feeding & swallowing team for oral motor & dietary assessment/consultation days, M-F; & (b) videofluoroscopy feeding studies.

Staffing	T4 Pediatric Outpatient Clinics			
	Complex Care Clinic	Complex Feeding & Nutrition Clinic	Complex Pain Clinic	Child & Family Clinic (Child Maltreatment)
GP/NP/Ped'n	Ped'n +/- GP/NP	Ped'n + GI Med MD +/- GP/NP	Ped'n + Develop't'l Ped'n + Peds Anesthesiologist + C&W Psychiatrist	Ped'n +/- GP/NP +/- Psychiatrist
RN	✓	✓	✓	✓
SW	✓	On request/referral	✓	✓
Dietitian	✓	✓	On request/referral	On request/referral
Child life	On request/referral	On request/referral	On request/referral	On request/referral
OT	On request/referral	On request/referral	On request/referral	On request/referral
PT	On request/referral	On request/referral	✓	On request/referral
SLP	On request/referral	On request/referral	On request/referral	On request/referral
RT	On request/referral	On request/referral	On request/referral	On request/referral
Psychologist	On request/referral	On request/referral	✓	✓
Pharmacist	On request/referral	On request/referral	✓	On request/referral (by phone)

Legend:

✓ = Consistent person(s) assigned & available on-site to participate in scheduled clinics. Consistent exposure to children with specified condition(s) allows for development of "enhanced skills" (see glossary) in specialty/subspecialty area.

On request/referral = Person(s) with general pediatric knowledge & skills is available on a limited, consultation basis to come to the clinic to assess & treat specific children. May not be a consistent person.

Notes:

1. MD requirement applies only to clinics with pre-scheduled MD visits. Protocols exist in all clinics to access urgent medical consultation outside hours.
2. Algorithm in place to respond to urgent requests, provide telephone follow-up, etc outside clinic hrs.

Outpatient procedures & treatments:

- Pediatrician or designate (e.g., resident) available on-site.
- RN practice is exclusively or primarily with children, many of whom have highly complex medical conditions.
- Pediatric-specific outpatient procedure/treatment staff, space & infrastructure. Used exclusively by children.
- Capacity within the operating room to perform procedures & treatments requiring sedation and/or anesthesia in children of any age with all levels of medical complexities as per the Children's Surgical Tiers module.

Community-based

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Appendix 1: Glossary

Registered Nurse with "pediatric skills"

- Demonstrates a broad understanding of growth and development. Distinguishes between normal and abnormal growth and development of infants, toddlers, children and youth.
- Understands the psychological impacts of care provision (including hospitalization) at different developmental stages (infant, toddler, preschooler, school aged and youth).
- Understands how to provide a physically and psychologically safe environment appropriate to the age and condition of the child.
- Demonstrates understanding of the physiological differences between infants, children and adults and their implications for assessment and care.
- Assesses a child's normal parameters, recognizes the deviations from the normal and acts appropriately on the findings.
- Demonstrates knowledge of common pediatric conditions and their management.
- Demonstrates understanding of fluid management in an infant and child.
- Calculates and administers medications and other preparations based on weight based dosages.
- Assesses child and family's knowledge and provides teaching specific to the plan of care and condition or procedure.
- Communicates effectively and works in partnership with children and families (children and family-centred care).
- Aware of and accesses pediatric-specific clinical guidelines and protocols.
- Responds to patient deterioration/acute urgent situations in an appropriate and timely manner.
- Commences and maintains effective basic pediatric life support, including 1- and 2-rescuer infant and child CPR, AED use and management of airway obstructions.
- Provides referrals to public health nursing, nutrition and utilizes contact with the child and family to promote child health. e.g., immunization, child safety.
- Assesses pain and intervenes as appropriate.*
- Initiates and manages peripheral IV infusions on children;* consults expert clinicians as necessary. Identifies and manages complications of IV therapy.

*Refer to body of document for examples of interventions appropriate at each tier.

References: NSW's Guidelines for Care in Acute Care Settings,¹² BC Children's Pediatric Foundational Competencies on-line course¹³ and BC Children's CAPE tools (2008-2010).¹⁴

"Enhanced pediatric skills" (refers to RNs and others on the interdisciplinary team)

- Demonstrates in-depth knowledge in a specific area of clinical care (e.g., respiratory diseases, sexual assault, diabetes, wound management, etc).
- Performs comprehensive assessments and plans, provides and evaluates care in children with suspected or known issues in specific areas of clinical care.

Reference: BC Children's CAPE tools.¹⁴

"Safe pediatric bed"

All hospitals that admit children must take steps to ensure the environment is as safe as possible for children. For a T1 service, this includes:

- Physical safety:
 - Area is physically safe for children with any potentially dangerous equipment, medications, chemicals or fluids out of reach or in locked cupboards.
 - Physical separation of children from adult patients is recommended. If physical separation is not possible, children are not in the same area/unit as adults who are under the influence of, or withdrawing from alcohol or chemical substances, known sex offenders, a danger to themselves or others and/or are confused and/or wandering.
 - Furniture meets appropriate safety standards for children. e.g., cribs with safe side rails and crib domes (if needed) for children 2 years of age or less.
- Psychological comfort:
 - Parents/primary caregivers are able to stay with their children 24/7 during hospitalization.
 - Self-served food and drink is in close proximity.
- Knowledgeable staff:
 - Sufficient "RNs with pediatric skills" are allocated each shift to ensure adequate supervision and care relevant to the age and nursing needs of child.
 - Criminal record checks are required as part of the credentialing and/or hiring process for all staff and physicians (as per legislation).
- Equipment and supplies:
 - Pediatric emergency equipment and supplies are in close proximity (refer to Appendix 1 in the Medical Tiers in Full document for a non-exhaustive list of equipment and supplies).

Additional requirements for a T2 service:

- Psychological comfort:
 - Access to child-friendly bathrooms and space for changing diapers.
 - Facilities for breastfeeding and breast milk storage.
 - Safe space(s) and age-appropriate facilities/equipment for children and youth to play/be entertained. e.g., age appropriate media, books or board games.

"Safe pediatric unit"

T3 and T4 services are required to have a "safe pediatric unit(s)" to provide inpatient care to children. In addition to the requirements for a safe bed, a "safe pediatric unit" includes:

- Physical safety:
 - Children are cared for on a dedicated pediatric inpatient unit(s).
 - Pediatric unit is functionally separate from adult patients, preferably with a door that can be closed and not opened by young children.
 - Regulated hot water temperature and secure electrical outlets are present on the unit.
- Psychological comfort:
 - Bedside sleeping facilities and ideally a kitchenette with fridge and microwave are available for parents/primary care givers.
 - Youth-friendly facilities/activities are available.

Child and family-centred care

Child & family-centred is one of the tenants of pediatric care. For all tiers, this means:

- Services are delivered in line with the principles of the UN Convention on the Rights of the Child (version in child friendly language is at: <http://www.unicef.org/rightsite/files/uncrcchildfriendlylanguage.pdf>).
- Children and their families are actively involved in health care planning and transitions.
- Children and their families are provided information about care options available to them in a way they can understand. This allows them to make informed choices.
- The chronological and developmental age of the child is considered in the provision of information and care.
- Families are actively encouraged to participate in the care of their child.
- Education is provided to children and their families who wish to be involved in providing elements of their own/their child's care.
- When families stay in hospital to help care for a child:
 - The environment supports family presence and participation (e.g., overnight accommodation, sitting room, quiet room/area for private conversation and facilities for making refreshments).
 - Consideration is given to their practical needs, including regular breaks for personal needs, to obtain food/drink, make telephone calls, etc.
- Information and support is given to families on how to access funds for travel to and from specialist centres.
- Information is available for children and their families in several formats including leaflets and videos. Information is culturally and age-appropriate and is provided in a variety of commonly used languages.
- Child and their families have access to professional interpreter services.
- Children and their families are provided with contact details for available support groups, as appropriate.
- Transition pathways are in place to allow for seamless transition to adult services.
- Children and families are actively encouraged to assist in identifying safety risks (e.g., ask questions about medications, question providers re hand washing etc).
- Opportunities are available for children and their families to provide input on the quality and safety of care provided (e.g., surveys, committees, rounds, parent advisory council, etc).

Adapted from:

- Institute for Healthcare Improvement, the National Initiative of Children's Healthcare Quality and the Institute for Patient- and Family-Centered Care, Patient- and Family-Centered Organizational Self-Assessment Tool, 2013.¹⁵
- Welsh Assembly Government, All Wales Universal Standards for Children and Young People's Specialised Healthcare Services, 2008.¹⁶
- Maurer, M et al, Guide to Patient and Family Engagement: Environmental Scan Report (Agency for Healthcare Research and Quality), 2012.¹⁷